

# **TRENTON**

***water pollution  
control plant***

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ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET, TORONTO 5  
OFFICE OF THE GENERAL MANAGER

Members of the Trenton Local Advisory Committee,  
Town of Trenton.

Gentlemen:

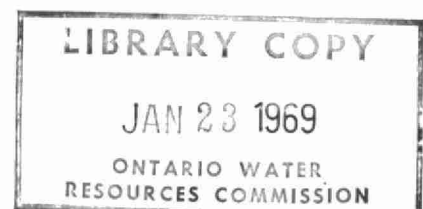
We are happy to present you with the 1967 Operating Summary for the  
Trenton Water Pollution Control Plant, OWRC Project No. 2-0004-57.

Your co-operation with our staff throughout the year has been appreciated.  
Only with such co-operation can the war against water pollution be waged  
effectively.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,  
General Manager.





ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

J. A. VANCE, LL.D.  
CHAIRMAN

J. H. H. ROOT, M.P.P.  
VICE-CHAIRMAN

D. S. CAVERLY  
GENERAL MANAGER

W. S. MACDONNELL  
COMMISSION SECRETARY

General Manager,  
Ontario Water Resources Commission.

Dear Sir:

I am pleased to submit to you the 1967 Operating Summary for the Trenton Water Pollution Control Plant, OWRC Project No. 2-0004-57.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

A handwritten signature in dark ink, reading "D. A. McTavish". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

D. A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.

## FOREWORD

● This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

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**TRENTON**  
**water pollution control plant**

operated for

THE TOWN OF TRENTON

by the

ONTARIO WATER RESOURCES COMMISSION

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DIVISION OF PLANT OPERATIONS

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Assistant Director: C. W. Perry  
Regional Supervisor: P. J. Osmond  
Operations Engineer: J. N. Dick

801 Bay Street Toronto 5

# '67 REVIEW

The Trenton Water Pollution Control Plant treated a total of 405.32 million gallons of sewage in 1967. The average daily flow was 1.11 million gallons.

The operating costs in 1967 were \$22,513.98, about \$3,000 more than the budgeted amount. The increase in costs was due to an increase in payroll expenditures necessitated by the prolonged illness (approximately five months) of the Chief Operator, Mr. James Stewart. Mr. Stewart died in December.

The average BOD and suspended solids concentrations in the plant influent were 289 and 278 respectively. The concentrations of BOD and suspended solids in the effluent were 105 and 69 ppm respectively. This resulted in a BOD reduction of 64 percent and a suspended solids reduction of 75 percent. These values are quite satisfactory for a primary treatment plant.

The average BOD loading on the plant in 1967 was 3,200 lbs. of BOD per day. The average suspended solids loading on the plant in 1967 was 3,080 lbs. of suspended solids per day. The design loading of the plant is 2,500 lbs. per day and 2,000 lbs. per day of BOD and suspended solids respectively.

Unusual operating problems occurred in the following areas:

1. New controls were installed in the heat exchanger to meet Department of Energy regulations.
2. The recirculation pump was overhauled and resleeved.
3. The gas compressor was rebuilt. This was the first significant repair to the compressor since the plant started operation in 1960.
4. The No. 2 lift pump was resleeved and fitted with new bearings. This was the first repair to this pump since its installation.
5. The diesel, which is used for stand-by power in the pumphouse, failed in December due to water in the oil. Modifications were made to the unit which should prevent this from happening again.
6. One Roots-Connersville blower failed in December and was replaced with a new unit. The cost for repairs would have exceeded the cost for replacement.



## PROJECT COSTS

NET CAPITAL COST (Estimated)	
Long Term Debt to OWRC	\$ <u>515,665.11</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967	\$ <u>103,449.23</u>
Debt Retirement	\$ 10,406.00
Reserve	2,153.81
Interest Charged	29,080.14
Net Operating	22,513.98
	<hr/>
TOTAL	\$ <u>64,153.93</u>

### RESERVE ACCOUNT

Balance at January 1, 1967	\$ 27,370.53
Deposited by Municipality	2,153.81
Interest Earned	<u>1,597.90</u>
	\$ 31,122.24
Less Expenditures	<hr/> -
Balance at December 31, 1967	\$ <u>31,122.24</u>

## MONTHLY OPERATING COSTS

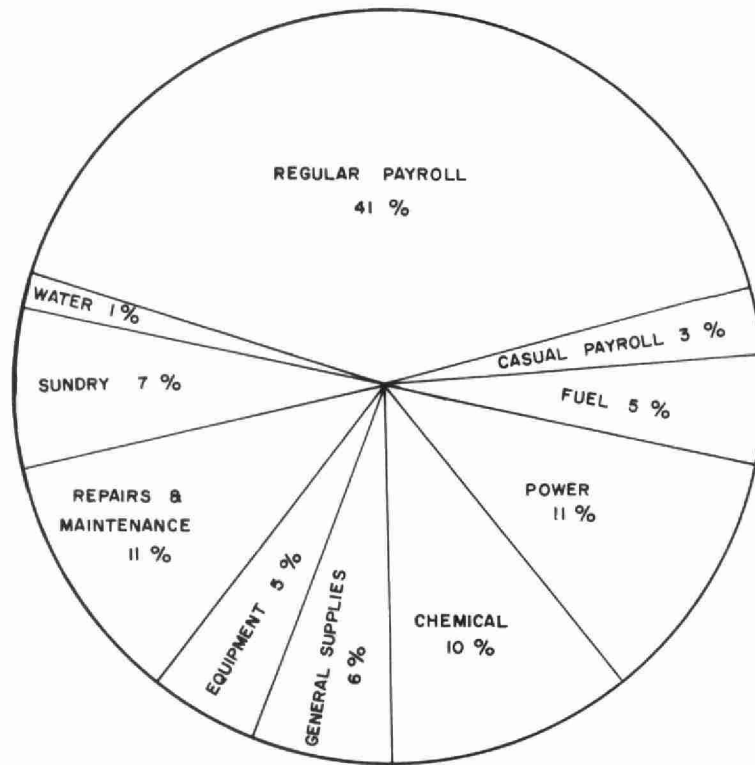
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	1,030.74	732.01	25.22	51.53			70.88		139.23	11.87	
FEB	1,514.18	694.86		77.28	199.72		24.90	311.12		98.44	8.86
MARCH	2,219.17	1240.21		160.96	130.54	505.05	60.37	(100.04)	23.24	103.75	95.08
APRIL	1,005.02	573.17		117.74	181.60		57.10			53.70	21.71
MAY	1,801.46	631.53		125.43	226.92	456.75	102.98	( 3.25)	188.52	48.11	24.47
JUNE	1,861.68	670.09		119.32	221.74		481.95		248.00	92.23	22.35
JULY	2,009.62	584.06		90.26	206.27	456.75	88.38		400.63	161.78	21.49
AUG	1,940.75	651.18	247.23		204.31		71.46	360.61	309.47	77.97	13.52
SEPT	2,232.92	1100.95	279.45		238.67		96.42	287.12	142.04	63.20	25.07
OCT	1,566.92	638.50	76.35		189.01	456.76	94.15		18.55	67.77	25.83
NOV	2,225.59	812.49		40.74			35.69	175.82	662.03	497.26	1.56
DEC	3,204.93	862.25		297.38	667.39	456.75	215.24		387.88	247.38	70.63
TOTAL	22,513.98	9197.30	628.25	1080.64	2466.17	2332.06	1399.52	1031.33	2519.59	1523.50	335.57

BRACKETS INDICATE CREDIT

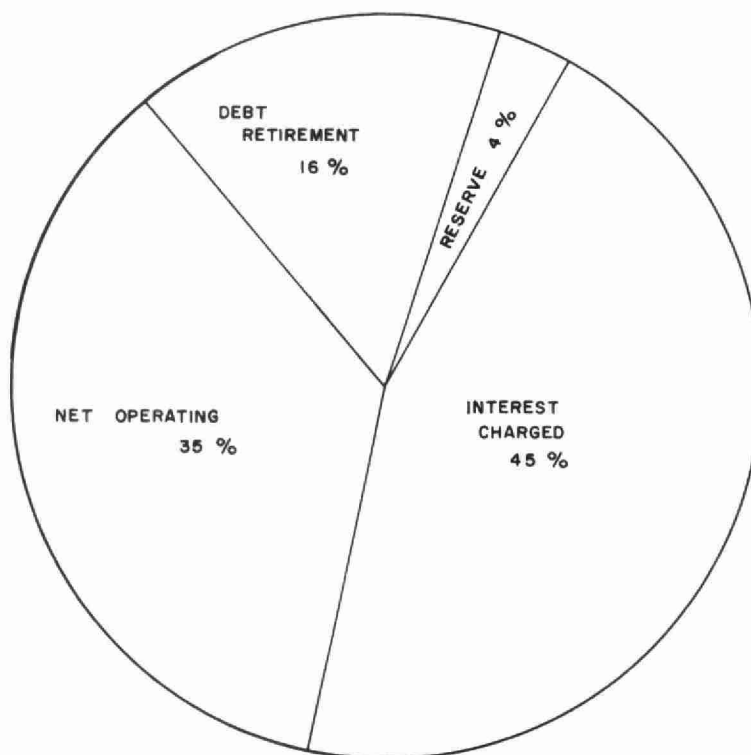
## YEARLY OPERATING COSTS

YEAR	M. G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1962	496.00	\$ 12,577.44	\$25.35	2.5 CENTS
1963	384.00	\$ 12,104.42	\$31.52	5.0 CENTS
1964	184.25	\$ 18,422.16	\$99.98	12.5 CENTS
1965	214.87	\$ 19,519.53	\$90.84	5 CENTS
1966	233.76	\$ 19,154.53	\$81.94	5 CENTS
1967	405.32	\$ 22,513.98	\$55.55	3 CENTS

## 1967 OPERATING COSTS



## TOTAL ANNUAL COST



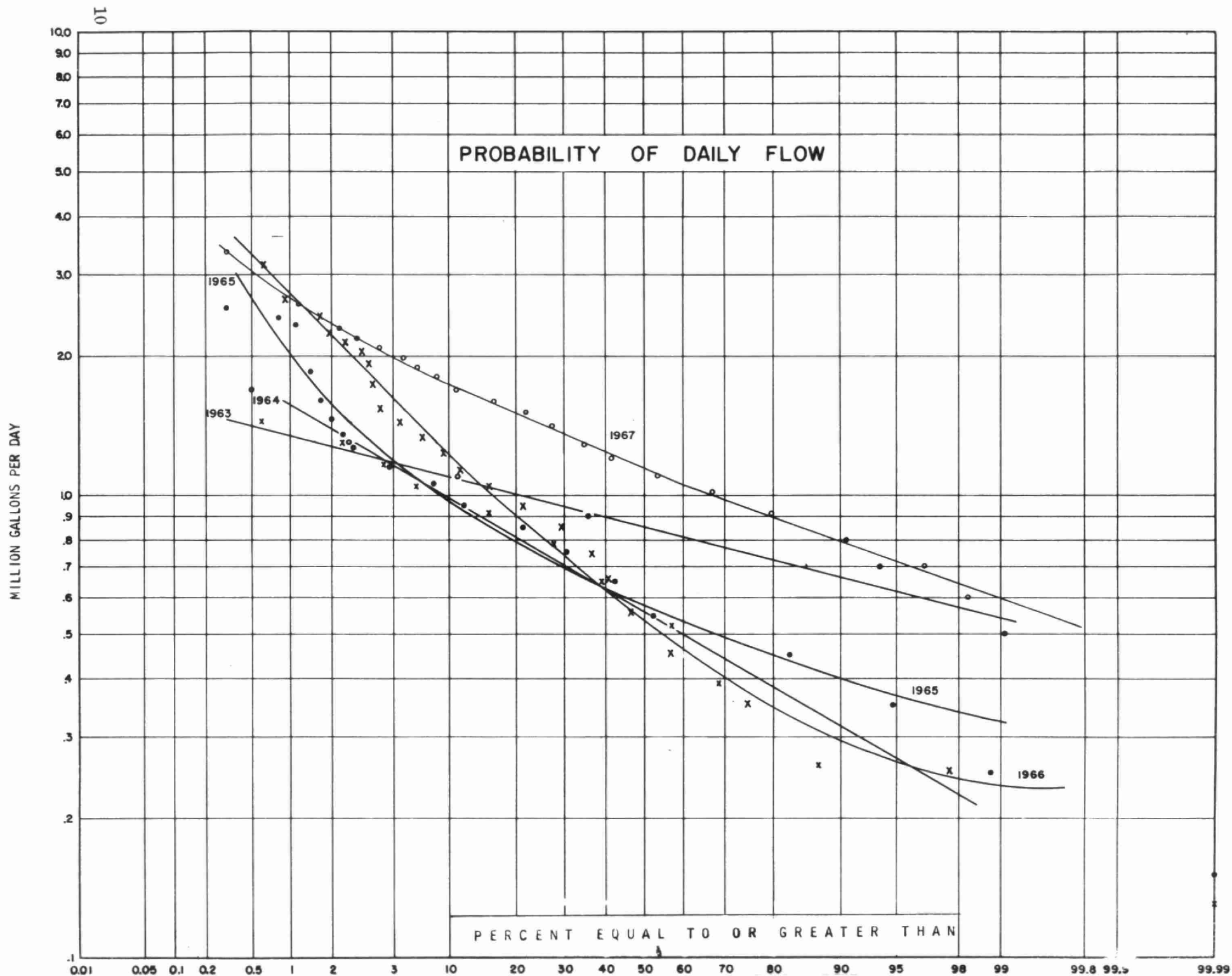
## **Process Data**

### PROBABILITY OF FLOWS

The probability of flow graph indicates that the plant flow was 1.2 mgd 50 percent of the time and exceeded twice the design flow five percent of the time.

### DAILY FLOWS

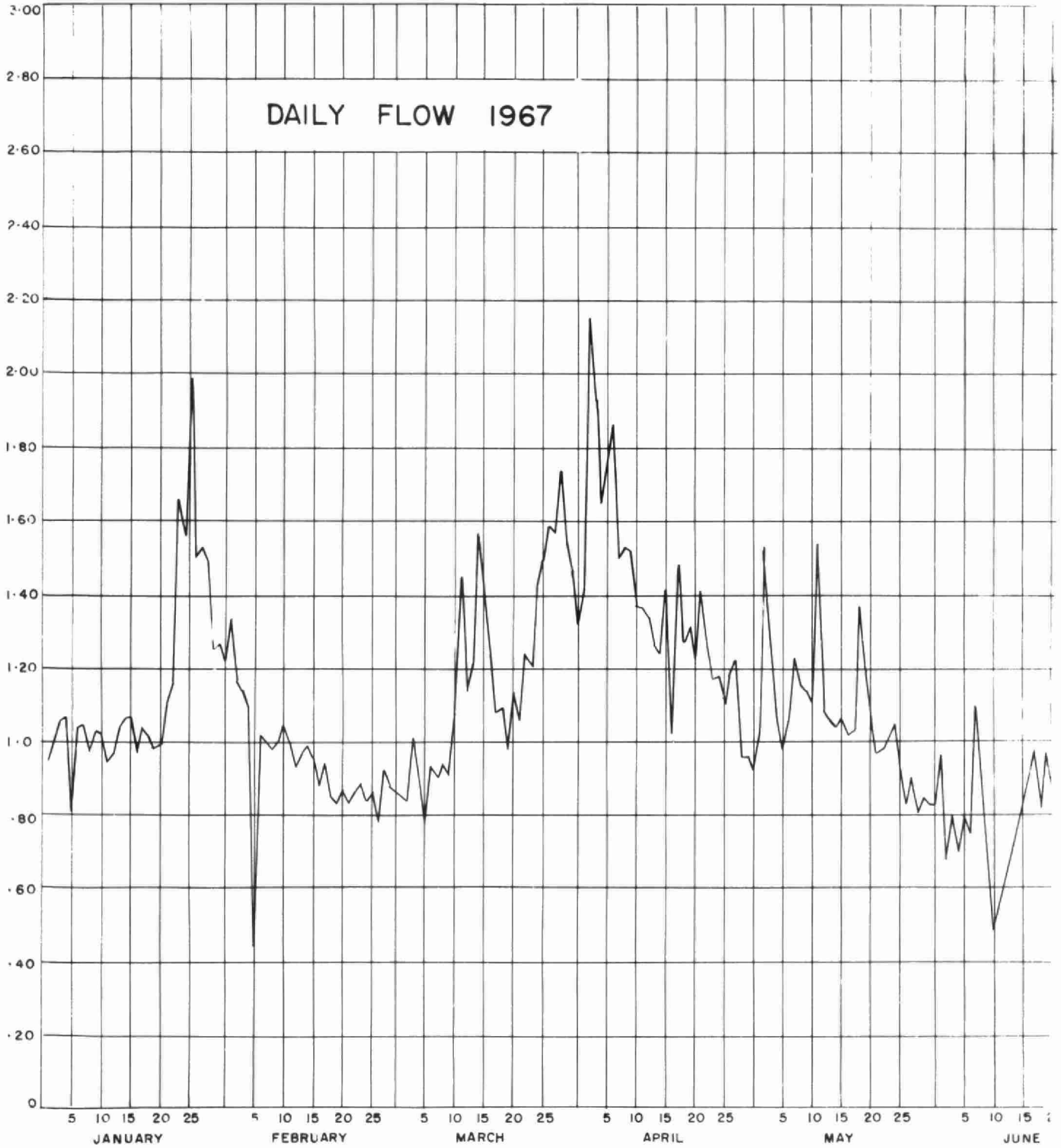
The daily flow graph indicates that the plant was hydraulically overloaded in the latter part of January; all of March, April and May; the last week in September; the latter part of October, and all of November and December. The greatest flows were received during the latter part of the year.

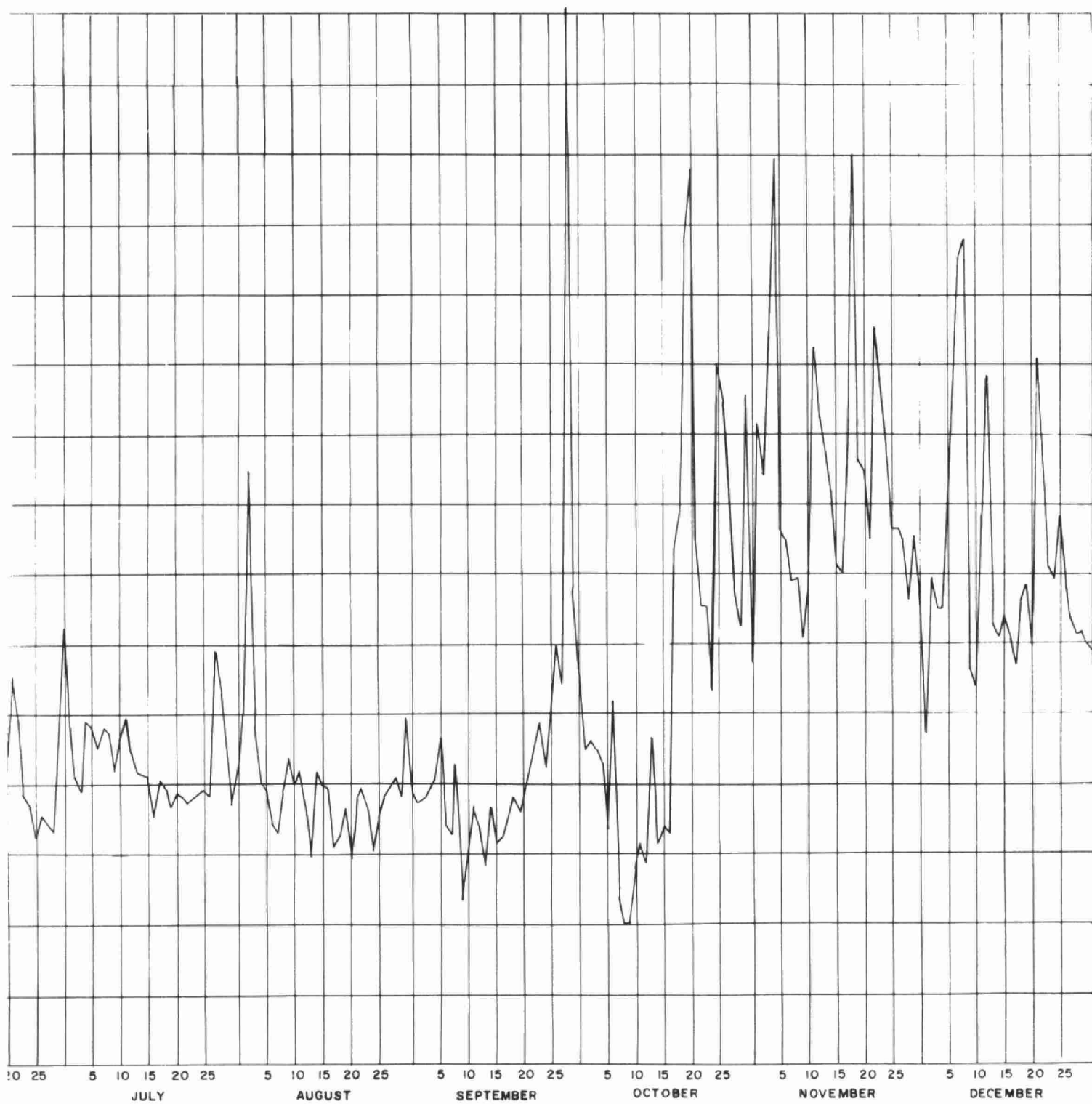




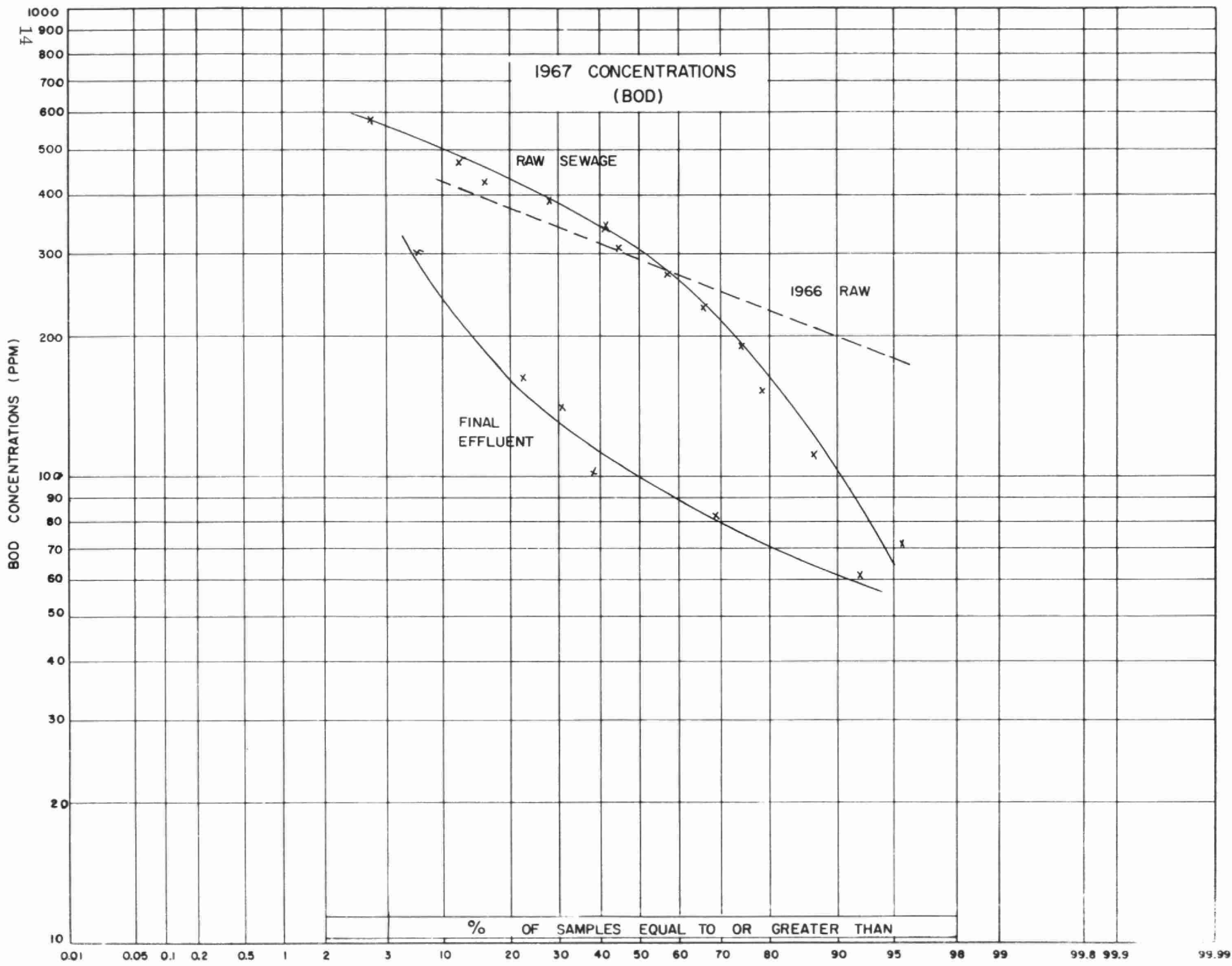
DAILY FLOW MG.

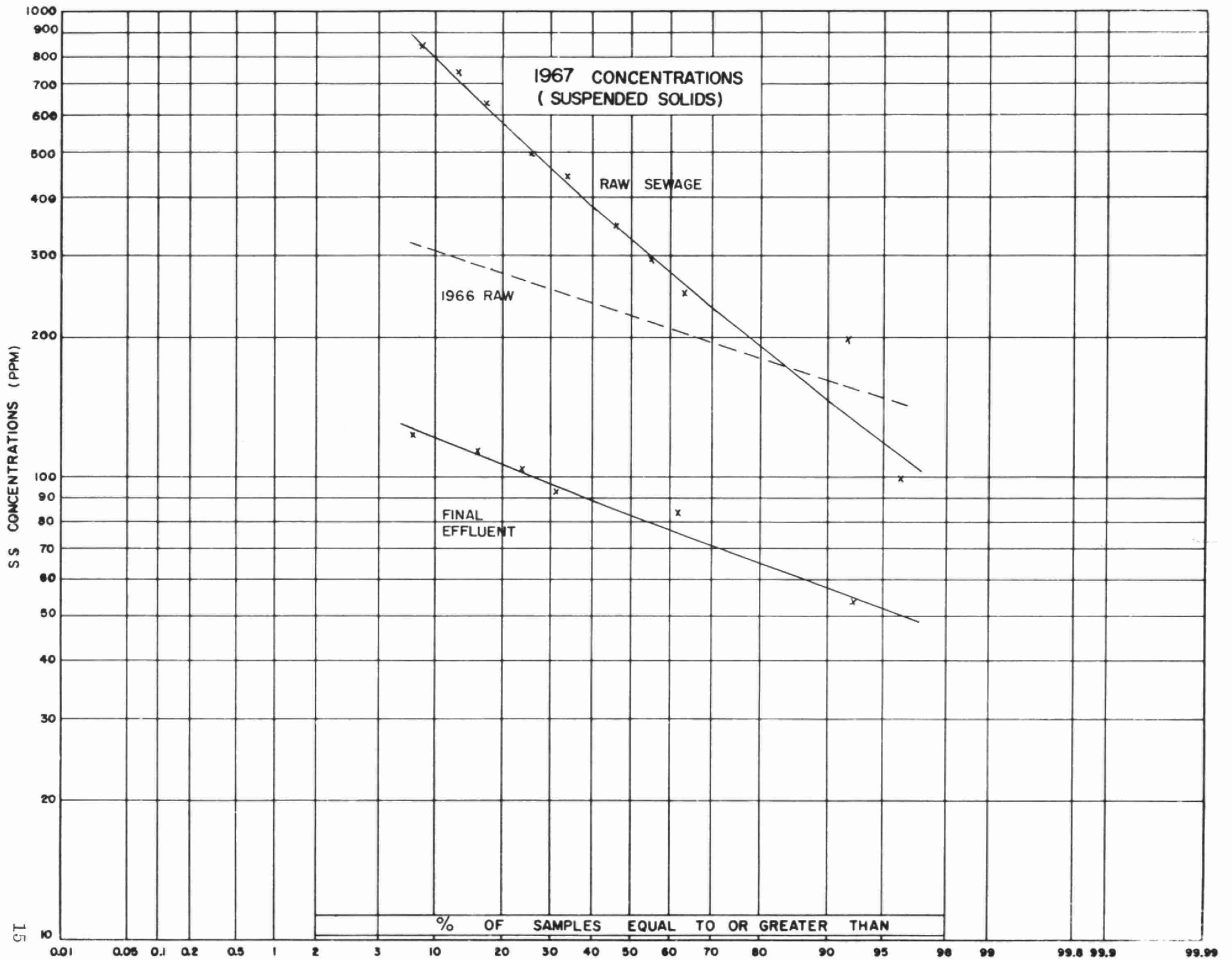
# DAILY FLOW 1967

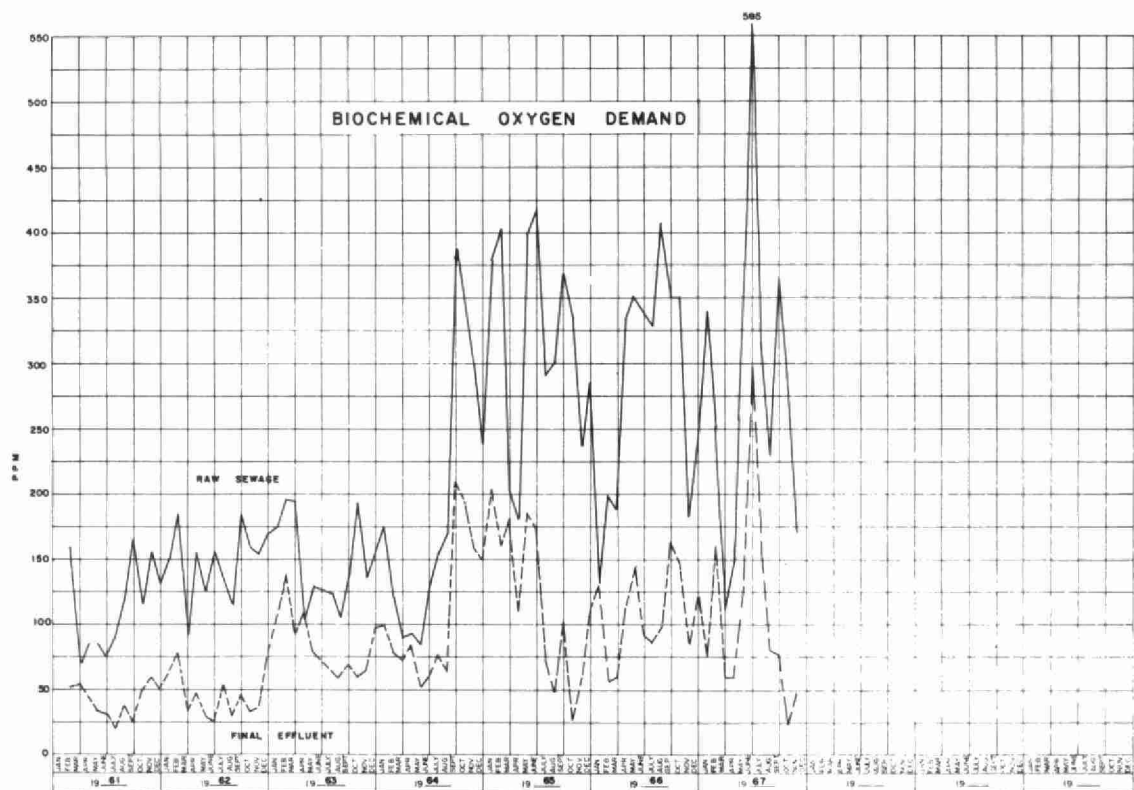




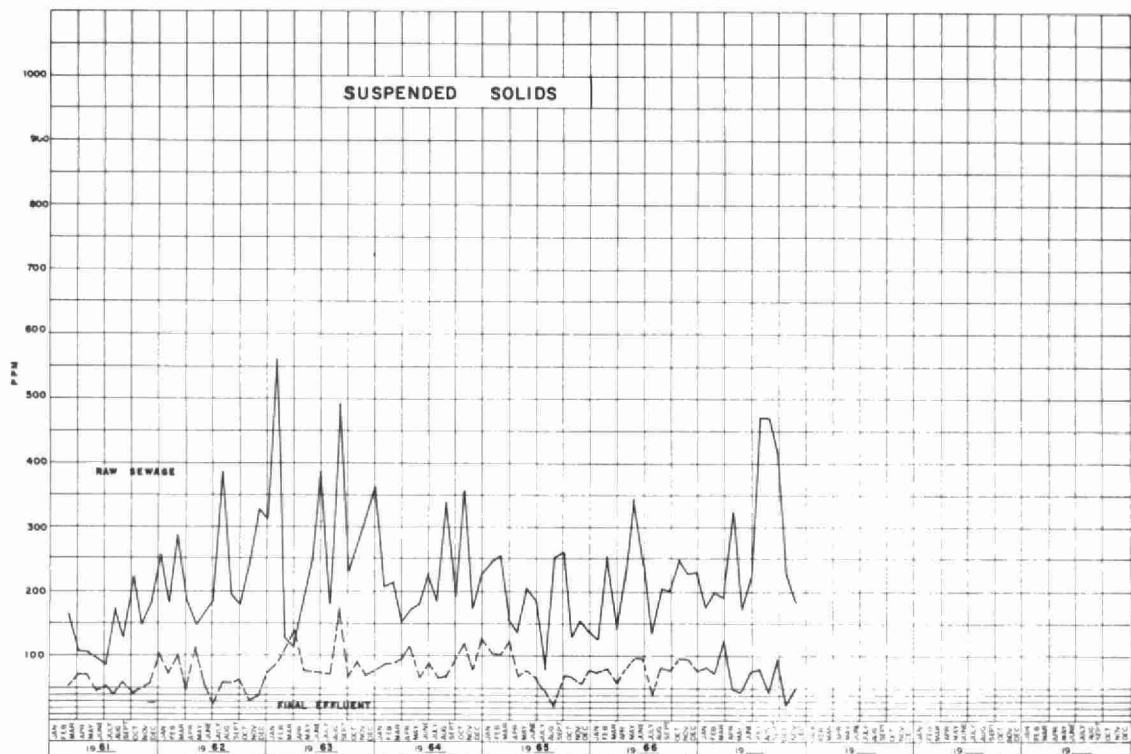








## MONTHLY VARIATIONS



## GRIT, B.O.D AND S. S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	340	75	77.9	47.26	176	87	50.6	15.87	10
FEB.	250	160	36.0	11.82	200	76	62.0	16.29	35
MAR.	111	58	47.7	9.83	194	122	37.1	13.36	31
APR.	153	58	62.1	19.49	326	50	84.7	56.62	38
MAY	375	124	66.9	41.40	172	46	73.2	20.78	17
JUNE	585	298	49.0	34.44	220	78	64.5	17.04	25
JULY	315	157	50.1	21.26	472	80	83.0	52.74	79
AUG.	230	80	65.2	11.25	471	46	90.2	51.43	66
SEPT.	367	75	79.6	38.94	410	96	76.6	41.87	40
OCT.	280	22	92.1	45.83	226	26	88.5	35.53	47
NOV.	170	46	72.9	31.31	186	50	73.1	37.34	13
DEC.	*289	105	63.6	40.89	*278	69	71.2	46.45	30
TOTAL	-	-	-	372.90	-	-	-	423.56	431
AVG.	289	105	63.6	31.07	278	69	71.2	35.30	36

\* Average values used.

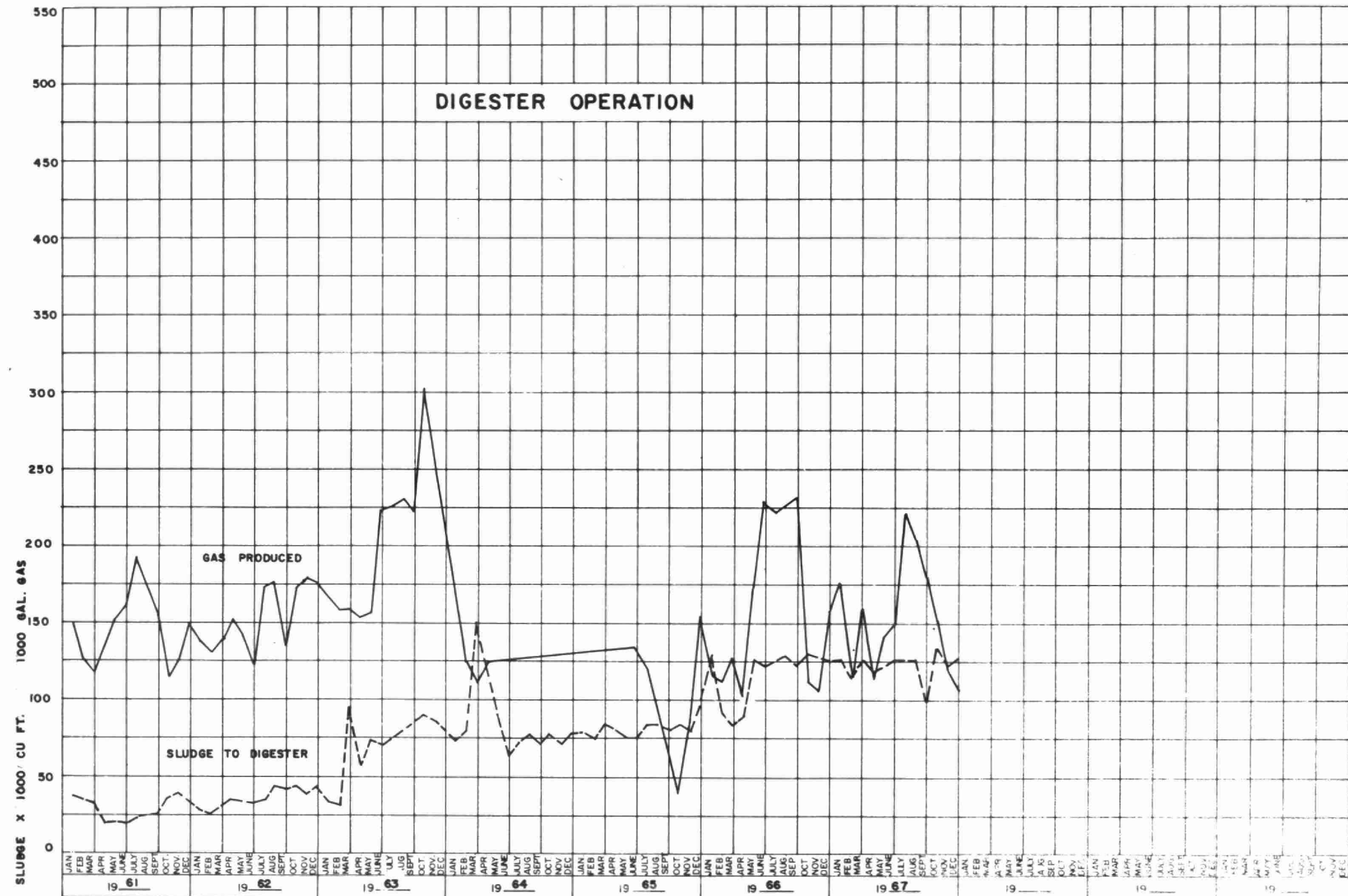
### COMMENTS

The concentrations of the BOD and suspended solids in the raw waste in 1967 were 289 ppm and 278 ppm respectively. The results were obtained from 11 eight-hour composite samples gathered in Trenton and submitted to the OWRC Laboratory for analysis. The BOD of the waste was approximately the same as the previous year but the suspended solids showed an increase.

The BOD and suspended solids in the plant effluent were 105 ppm and 69 ppm respectively. This represents a percent reduction in BOD of 64 percent and in suspended solids of 75 percent. This showed an increase in efficiency over the 1966 results and is well within the accepted standards for a primary treatment plant.

The total amount of grit removed from the waste in 1967 was 431 cubic feet. This was a decrease from the 538 cubic feet of grit removed in 1966.

## DIGESTER OPERATION



## DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu Ft
	GALLONS	% SOLIDS	% VOL MAT	GALLONS	% SOLIDS	% VOL MAT	
JAN	126,480	2.85	-	-	8.52	-	176.531
FEB	114,240	1.29	-	-	-	-	114.851
MAR	126,480	2.91	64.60	9,000	13.71	59.08	158.616
APR	117,840	2.50	76.00	39,500	13.76	43.89	114.135
MAY	120,960	1.55	76.77	7,000	10.24	43.55	141.218
JUNE	126,480	3.71	76.28	20,000	-	-	148.612
JULY	126,480	7.06	46.60	-	11.60	40.51	222.428
AUG.	126,480	7.15	49.51	-	5.30	33.20	204.352
SEPT.	98,760	.64	73.44	-	11.81	31.58	179.767
OCT.	133,280	3.01	73.08	19,000	14.04	31.98	151.718
NOV.	122,400	-	-	22,000	-	-	118.990
DEC.	126,480	-	-	-	-	-	106.256
TOTAL	1,466,360	-	-	116,500	-	-	1,837.474
AVG.	122,197	2.97	63.29	19,416	11.12	40.54	153.123

### COMMENTS

During 1967, a total of 1,466,360 gallons or 235,000 cubic feet of raw sludge was pumped to the digesters. This sludge had an average solids concentration of 2.97 percent, or an equivalent of 435,000 pounds of total solids and 275,000 pounds volatile solids. A total of 116,500 gallons of digested sludge was pumped from the digesters. The average solids concentration of the digested sludge was 11.1 percent. The total amount of digested solids was 130,000 pounds and the total amount of volatile solids was 52,000 pounds. The amount of volatile matter destroyed in the digester was 223,000 pounds.

This resulted in a gas production of 8.2 cubic feet per pound of volatile matter destroyed, or approximately the same as for the previous year.

## CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	35.67	1427	4.00
FEBRUARY	26.27	1256	4.78
MARCH	37.10	1396	3.76
APRIL	41.03	1238	3.02
MAY	32.99	1342	4.00
JUNE	24.00	1385	5.77
JULY	26.91	1425	5.30
AUGUST	24.20	1376	5.68
SEPTEMBER	26.67	1296	4.86
OCTOBER	35.53	1331	3.75
NOVEMBER	50.50	1286	2.55
DECEMBER	44.45	1284	2.89
TOTAL	405.32	16042	-
AVERAGE	33.77	1337	4.20

## COMMENTS

Continuous chlorination of the plant effluent was practised in 1967 for disinfection purposes. An average of 4.20 ppm of chlorine was required to obtain OWRC objective of 0.5 ppm chlorine residual after 15 minutes contact.

LABORATORY LIBRARY



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## RECOMMENDATIONS

1. The Town of Trenton should continue its program of eliminating storm water from the sanitary sewers.
2. Since the plant was organically and hydraulically overloaded every day of 1967, efforts should be made to expand the plant in the near future.

Date Due


#1



